DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

Bay Area Branch
690 Walnut Ave.St. 150
Vallejo, CA 94592-1133
(707) 649-5453
(707) 649-5493

Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 69.28

WELDING INSPECTION REPORT

Resident Engineer: Pursell, Gary
Address: 333 Burma Road
City: Oakland, CA 94607

Report No: WIR-002725
Date Inspected: 30-May-2008

Project Name: SAS Superstructure
Prime Contractor: American Bridge/Fluor Enterprises, a JV
Contractor: Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island

OSM Arrival Time: 630
OSM Departure Time: 1530
Location: Shanghai, China

CWI Name:	Shazhi and Zhang Bao Lei			**CWI Present:**	☑ Yes	☐ No	
Inspected CWI report:	☐ Yes	☑ No	☐ N/A	**Rod Oven in Use:**	☑ Yes	☐ No	☐ N/A
Electrode to specification:	☑ Yes	☐ No	☐ N/A	**Weld Procedures Followed:**	☑ Yes	☐ No	☐ N/A
Qualified Welders:	☑ Yes	☐ No	☐ N/A	**Verified Joint Fit-up:**	☑ Yes	☐ No	☐ N/A
Approved Drawings:	☑ Yes	☐ No	☐ N/A	**Approved WPS:**	☑ Yes	☐ No	☐ N/A
				Delayed / Cancelled:	☐ Yes	☑ No	☐ N/A

Bridge No: 34-0006
Component: OBG and SAS Tower Fabrication

Summary of Items Observed:

On this date, Caltrans Office of Structural Material (OSM) Quality Assurance (QA) Inspector Joselito Lizardo was present as requested to perform observations on the fabrication of Orthotropic Box Girder (OBG) and SAS Tower at Zhenhua Port Machinery Company (ZPMC) facility at Changxing Island, in Shanghai, China.
The QA Inspector has randomly observed the following activities on these Bays mentioned below;

Bay 2: 77 and 114M Tower Mock-ups, Plate Cutting, Rolling
This QA Inspector observed Tower Mock-up, and rolling machine was idle. Whereas on cutting machine, there was no Caltrans job on the table. On horizontal milling machine/ beveling, three 75mm thick diaphragm plates with mark SA287, P307 and SA196 were seen in progress. Drilling of 36-24mm diameter bolt holes on 28mm thick connector plates was seen on going.

Bay 3: OBG side/bottom/edge panel:
The QA Inspector randomly observed ZPMC welder operators ID Number 048801 and, Liu Zihong ID Number 062447, utilizing the Flux Cored Arc Welding (FCAW) Process in the 2F (Horizontal Fillet) Position with a gantry mounted welding apparatus and ZPMC Weld Procedure Specification (WPS) WPS-B-T-2123-3, to weld open-ribs stiffeners to side panel SP090-001-001~010. The QA Inspector randomly observed ZPMC CWI Zhang Bao Lei monitoring weld parameters. The QA Inspector also randomly monitored weld parameters and recorded them as follows: 295 amps, 29.8 volts for welder ID# 048801 and 305 amps, 30.0 volts for ID# 062447. Travel speed for all welds was randomly observed at 440 millimeters (mm) per minute. The weld parameters appeared to comply with contract requirements.

The QA Inspector randomly observed ZPMC welder Li Xuehua ID number 058174, utilizing the FCAW process with a 1.4mm diameter electrode, filler metal brand E71T-1, class Supercored 71H in the 3G (Vertical Groove) Position with ZPMC WPS WPS-B-T-2233-B-U2-F, to weld groove splice butt joint on W18 X 46 flange to make WT rib stiffener for side panel SP183-001-004 and SP183-001-003. The QA Inspector randomly observed ZPMC CWI Lu Xiaoying monitoring weld parameters.

This QA also observed tack welding/fit up of open rib stiffeners on various side and edge panels using electrode THJ506Fe-1, 4.0mm diameter. Grinding/cleaning of these tack welds were on going so with paint coating removal on panel plates.

This QA randomly observed heat straightening of spliced plate EP37A + EP51A being performed by ZPMC personnel due to welding distortion. Oxy-acetylene gas was used and procedure HSR1(B)-1067 with less than 600 degree C thermal heat input was implemented. The plate material is A709M-345F2-X and per ABF Inspector Kevin Dye who was present during this observation, the procedure mentioned here has not been submitted for approval. With this, there is procedural infraction thus ABF Inspector Kevin Dye said has to issue NCR against ZPMC.

Bay 4: Tower Diaphragm

The QA Inspector randomly observed ZPMC welder Gu Cai Hong ID Number 046830, utilizing the Submerged Arc Welding (SAW) Process in the 1G Position (Flat Groove) with ZPMC WPS WPS-B-T-3221-B-U3c-S-1, to weld the fill pass in weld joint SSD1-SA333A/B 1A2A on Tower Diaphragm Top Plate Sub-Assembly. The QA Inspector randomly observed ZPMC CWI Lvliqing monitoring weld parameters. The QA Inspector also randomly monitored weld parameters and recorded them as follows: 624 amps, 31.1 volts with a travel speed of 485 mm per minute. The weld parameters appeared to comply with contract requirements.

The QA Inspector randomly observed ZPMC welder ID Number 048810 utilizing the FCAW Process in the 1G (Flat Groove) Position with ZPMC WPS WPS-B-T-2331-B-P3-F-1, to weld fill pass on plate splice butt joint of ESD1-SA313-14 tower diaphragm sub-assembly. The QA Inspector randomly observed ZPMC CWI Lvliqing monitoring weld parameters. The same ZPMC CWI Inspector was observed monitoring FCAW, 3G welding on diaphragm ring ESD1-SA287-6A and was using WPS-B-T-2233-B-U3-F.

This QA randomly observed the second time heat straightening of side panel SP413(A)-001 due to welding distortion. Oxy-acetylene was used and less than 650 degree C thermal heat input was implemented following procedure HSR1(B)-1054. Bending of heavy plates P667(W)-1 4/21(G) and P667(S)-1 4/21(P) for diaphragm ring using oxy-acetylene with thermal heat input of less than 650 degree C and following procedure HSR1(T)-2049 and HSR1(T)-2048 respectively.

This QA Inspector randomly observed ZPMC NDT Zhou Dongyun perform 10% Magnetic Particle Testing on fillet welds of side panels SP528-001-001~014 and SP754-001-001~012. It was noted that rust and scale have been removed by ZPMC workers on both sides of weld areas prior MT testing. Electromagnetic Yoke was used with alternating current (AC) as power source. The detection media used was dry red ferromagnetic particles and applied with powder blower while the magnetizing force is on.

Bay 7: OBG - Floor Beam Sub Assembly:

The QA Inspector randomly observed ZPMC welder Huang Xin Lan ID Number 044780, utilizing the Submerged Arc Welding (SAW) Process in the 1G Position (Flat Groove) with ZPMC WPS WPS-B-T-2221-B-L2c-S-1, to weld the cover pass in plate splice butt joint FB029-001-079 floor beam. The QA Inspector randomly observed ZPMC CWI Huang Wen Pang monitoring weld parameters. The QA Inspector also randomly monitored weld parameters and recorded them as follows: 510 amps, 29.5 volts with a travel speed of 420 mm per minute. The weld parameters appeared to comply with contract requirements.

QA Inspector J. Lizardo randomly observed ZPMC qualified welder Xie Jin Xia ID #048038 welding 1G groove root pass on floor plate splice butt joint. Ms. Xie was observed utilizing a flux corded arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand E71T-1, class Supercored 71H, semi automatic at floor beam FB030-001-081/101. QA Inspector Lizardo observed the ZPMC QC CWI Inspector Huang Wen Pang verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector to be: preheat temperature greater than 65°C and welding parameters amps of 287, volts of 30.0, a travel speed of 527 mm/min. Welding parameters observed by QA Inspector Lizardo appear to be in general compliance with the approved WPS-B-T-2231-B-U2-F-1.

This Inspector randomly observed tack welding/fit up of various stiffeners to web plates on floor beams FB009-008-011 and FB015-011-018 using TL-508 electrode. Noted ZPMC qualified welders doing this task were Li Wenguo and Li Zhengxu. FCAW fillet welding (2F) was also observed on flange to web plate of floor beam FB012-006-043.
Other activities observed on this bay include back gouging of floor beam plate FB019-001 after welding one side, grinding/excavation of notches on floor beam plate FB035-001 for minor repair, preheating of plate splice butt joint with ceramic heaters prior welding, FCAW CJP welding (1G) on lifting lug to edge of plate and cutting of access hole on 300mm X 300mm diagonal brace of floor beam assembly.

Bay 8: Tower Diaphragms
The QA Inspector randomly observed ZPMC welder ID Number 050323, utilizing the SAW Process in the 1G (Flat Groove) Position with ZPMC WPS WPS-B-T-3221-B-U3c-S-1 to weld the fill pass on butt splices of Tower Diaphragm SSD1-SA270-1A/2A. The QA Inspector randomly observed the preheat temperature and found out greater than 230 degree C while welding. This QA called the attention of ZPMC QC and ABF Inspector CK Chan and they immediately stopped the welding. They then agreed to let the plate cool down prior to resume welding.

The QA Inspector randomly observed ZPMC welders ID Number 045236 and ID number 058482, utilizing the FCAW Process in the 3G (Horizontal Groove) position with ZPMC WPS WPS-B-T-2233-B-U3-F, to weld bent heavy plate splice butt joint on tower diaphragm rings WSD1-SA226-9B and SSD1-270-5B respectively. The QA Inspector randomly observed ZPMC CWI Shazhi monitoring weld parameters. The weld parameters appeared to comply with contract requirements.

This QA Inspector randomly observed ZPMC welder Yu Jianguo ID number 048433, using FCAW process in the 1G position to weld PJP on corner joint of flange to web plate of longitudinal diaphragm LD007-001-011/012. The QA Inspector randomly observed ZPMC QC monitoring the welding parameters using WPS-B-T-2232-Tc-U4b-F-1 as reference.

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Other related welding activities observed were bevel cutting on bent heavy plates for tower diaphragm rings and tack welding/fit up of stiffener to web plates on various longitudinal diaphragms.

Summary of Conversations:

No significant conversation ocurred today.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Mazen Wahbeh, (818) 292-0659, who represents the Office of Structural Materials for your project.

Inspected By:	Lizardo,Joselito	Quality Assurance Inspector
Reviewed By:	Cochran,Jim	QA Reviewer